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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,322	05/20/2005	Antoniangelo Agnesi	METRO800US	6653
24235 7590 06/28/2007 LEVINE & MANDELBAUM 444 MADISON AVENUE 35TH FLOOR NEW YORK, NY 10022			EXAMINER CARTER, MICHAEL W	
			ART UNIT 2809	PAPER NUMBER
			MAIL DATE 06/28/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/529,322

Applicant(s)

AGNESI ET AL.

Examiner

Michael Carter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,7-10,12-19 and 21-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,7-10,12-19 and 21-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/25/05 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Immarco et al. US Patent 3,564,450 (hereinafter referred to as Immarco).
3. For claim 21, Immarco teaches a discrete element solid state laser resonator, containing an electro-optical Q-switching modulator, in which modulation of the loss state of the cavity is obtained through the combined effect of the electro-optical modulator and selection of the polarization determined through a wedge shaped birefringent medium (figure 1).
4. For claim 22, Immarco teaches A discrete element solid state laser resonator, operating in Mode-Locking regime, in which modulation of the loss state of the cavity is obtained with the cooperation of an electro-optical modulator and a wedge-shaped birefringent medium operating a selection of the polarization (figure 1). The limitation that the resonator is operating in Mode-Locking regime is a statement of intended use and does not differentiate the claimed invention from prior art.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 4-5, 7, 9-10, 12, 15, 16-19, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xie US Patent 5,905,7748 (hereinafter referred to as Xie) in view of Immarco.

7. For claim 1, Xie teaches a method for selecting a polarization of the laser beam inside a resonant laser cavity, which method provides generation of a laser beam inside said resonant laser cavity, comprising optical media, which include a wedge shaped birefringent optical medium (figure 1, label 26), wherein said birefringent optical medium is used for inducing a double refraction effect on the laser beam and, on the interface between said birefringent optical medium and a second medium with a different refractive index, separating propagation directions of different polarization components of the laser beam, providing a plurality of resonance directions which are distinct for the different polarization components, and wherein an optical axis of the cavity is selectively aligned on one of said resonance directions through the adjustment of the position of one or more optical elements forming said resonant laser cavity so as to modulate the loss state of the resonant laser cavity (figure 1, labels 20 and 22).

Xie does not teach the laser is operating in Q-switching or Mode-Locking regime, and the cavity comprises an electro-optical modulator that modulates the loss state of the resonant laser cavity.

However, Immarco does teach the laser is operating in Q-switching regime, and the cavity comprises an electro-optical modulator that modulates the loss state of the resonant laser cavity (figure 1, labels 15-16 and column 1, lines 15-20) for the production of giant laser pulses (column 1, lines 15-17)

It would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine Xie's laser with Immarco's Q-switch for the production of giant laser pulses.

8. For claim 4, Xie teaches inside said resonant laser cavity the plurality of resonance directions corresponds to a plurality of different optical paths enabling a particular polarization (column 6, lines 16-23).

9. For claim 5, Xie teaches introducing a controlled quantity of losses individually experimented by one or both the polarizations in a well delimited path in the resonant laser cavity (figure 3 and column 7, lines 24-26).

10. For claim 7, Xie teaches the resonant laser cavity contains a birefringent active laser material for producing the separated polarization components (figure 4, label 62 and column 9, lines 26-28).

11. For claim 9, Immarco teaches resonant laser cavity contains a Q-switching or Mode-Locking optical modulator, whose birefringent active optical element is used for producing the separated polarization components (figure 1, label 22 and column 1, lines 17-20).

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12. For claim 10, Immarco teaches more than one interface is used between the birefringent medium and another medium for separating the polarizations (figure 1, label 15).

13. For claim 12, Xie teaches selecting the polarization through the alignment of a mirror pertaining to the optical media of said resonant laser cavity (column 6, lines 16-23).

14. For claim 15, Xie teaches a laser system comprising a laser beam generated in a resonant laser cavity, said resonant laser cavity comprising optical media, which include a wedge shaped optical medium with birefringence properties (figure 1, label 26), wherein said wedge shaped optical medium with bi-refrindexe properties produces a double refraction for polarized components of said beam and multiple resonance conditions of the resonant laser cavity, and wherein said resonant laser cavity is aligned in one of said resonance directions by means of one or more optical elements forming it, for selecting a specific polarization component (column 6, lines 16-23).

Xie does not teach a laser system operating in Q-switching or Mode-Locking regime, said resonant laser cavity comprising an electro-optical modulator.

However, Immarco does teach a laser system operating in Q-switching or Mode-Locking regime, said resonant laser cavity comprising an electro-optical modulator (figure 1, labels 15-16, column 1, lines 15-20) in order to produce giant laser pulses (column 1, lines 16-17).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to combine Xie's laser with Immarco's Q-switching electro-optical modulator in order to produce giant laser pulses.

15. For claim 16, Xie teaches the resonant laser cavity contains a birefringent mirror, comprising birefringent material with first and second non parallel faces, said first face being disposed inside the resonant laser cavity and said second face comprising a mirror, said first face being angled with respect to the second, in a position to operate the separation process of the polarizations, and select them on the desired resonance position through the alignment of the mirror itself, or any another optical element of the resonant laser cavity (figure 5, labels 62 and 72 and column 9, lines 65-66).

16. For claim 17, Xie teaches the cavity contains an active birefringent mirror, consisting of birefringent material with first and second non parallel faces, said first face disposed inside the cavity and said second face comprising a mirror and disposed in a position to operate the separation process of the polarizations, and select them on the desired resonance position through the alignment of the mirror itself or any other optical element of the resonant laser cavity, and at the same time provide a laser gain to the resonant laser cavity (figure 5, labels 62 and 72 and column 9, lines 65-66).

17. For claim 18, Xie teaches the cavity contains a birefringent device, comprising birefringent material with non parallel first and second faces, the first face being angled with respect to the second face in a position to operate the separation process of the polarizations, and their selection by means of rotation

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around one of its own axis or realignment of any other optical element of said resonant laser cavity (figure 1).

18. For claims 19, 23, and 24, Xie teaches the birefringent material is YLF or Nd:YLF or GdVO₄ or YVO₄ or Nd:GdVO₄ or Nd:YVO₄ (column 4, line 45-46).

19. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xie in view of Immarco, and further in view of Motohiro et al. US Patent 5,571,612 (hereinafter referred to as Motohiro).

20. For claim 8, Xie and Immarco remain applied as above.

For claim 8, Xie and Immarco do not teach the resonant laser cavity contains a nonlinear crystal for producing the separated polarization components.

However, Motohiro teaches using a nonlinear crystal in order to provide an intensified nonlinear optical effect and excellent polarizing and birefringent characteristics (abstract).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to combine the method of Xie and Immarco with the nonlinear crystal of Motohiro in order to provide an intensified nonlinear optical effect and excellent polarizing and birefringent characteristics.

21. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xie in view of Immarco, and further in view of Friesem et al. US PG Pub. 2002/0154672 (Herein after referred to as Friesem).

22. For claims 13-24, Xie and Immarco remain applied as above.

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23. For claim 13, Xie and Immarco do not teach the method further comprising verifying the resonance of a polarization and avoiding total extinction of other possible polarizations.

However, Friesem teaches output beams (figure 20, labels 103-104) verify resonance and avoiding extinction of other possible polarizations (figure 20) in order to provide two output beams with different polarizations.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to combine the method of Xie and Immarco with Friesem's output and avoidance of total extinction in other polarizations in order to provide two output beams with different polarizations.

24. For claim 14, Xie and Immarco do not teach the method further comprising verifying the resonance of a polarization and maintaining simultaneous oscillation of a well controlled fraction of other possible polarizations.

However, Friesem teaches output beams (figure 20, labels 103-104) verify resonance and maintaining simultaneous oscillation of a well controlled fraction of other possible polarizations (figure 20) in order to provide two output beams with different polarizations.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to combine the method of Xie and Immarco with Friesem's output and maintaining simultaneous oscillation of a well controlled fraction of other possible polarizations in order to provide two output beams with different polarizations.

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shimoji US Patent 6,026,102 discloses a birefringent nonlinear crystal wedge. Suzuki et al. US Patent 5,430,754 and Erickson, US Patent 4,441,186 disclose cavities in which walk off in birefringent crystals are used to select polarization.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Carter whose telephone number is (571) 270-1872. The examiner can normally be reached on Monday-Friday, 7:00 a.m.-4:30 p.m., EST.

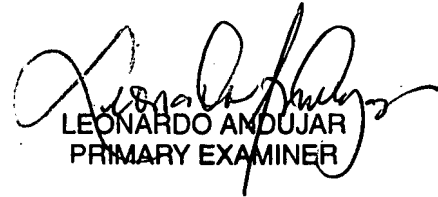
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on (571) 272-1206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service

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Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MC


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